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10/574,801	04/05/2006	Katsurou Nagaoka	1019519-000516	2052

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EXAMINER	
ROBINSON, ELIZABETH A	

ART UNIT	PAPER NUMBER
1794	

NOTIFICATION DATE	DELIVERY MODE
12/18/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/574,801	NAGAOKA ET AL.	
	Examiner	Art Unit	
	Elizabeth Robinson	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,7,8 and 12-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7,8 and 12-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 3-5, 7, 8 and 12-15 are currently pending.

Claim Rejections - 35 USC § 112

Claims 1, 3-5, 7, 8 and 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 states the limitation "…a coating amount of the silicone resin is from 0.4 to 45 mg/m^2." It is unclear if this is just the silicone portion of the resin, since both the silicone resin component and the actinic energy-curing resin both comprise silicone. Claims 3-5, 7, 8 and 12-14 all depend from claim 1 and are thus, also rendered indefinite.

Claim Rejections - 35 USC § 103

Claims 1, 7, 8, 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashida et al. (WO/2003/055679). The Examiner is using US 2005/0106404 (hereafter referred to as Hayashida '404) as the English language equivalent of the World document.

Regarding claims 1 and 8, Hayashida '404 (Paragraph 1) teaches a composite hard coat layer formed on the surface of an article. This composite layer is formed by

coating an actinic energy-ray curing hard coat agent onto the surface of the article, coating an actinic energy-ray curing surface layer onto the hard coat agent and then curing both layers simultaneously to form the composite hard coat layer (Paragraphs 47-49). Since the two portions of the composite hard coat layer are each coated and then cured together, they will form a single composite layer, as there will be some intermixing of the two portions of the layer prior to curing. The surface portion of the layer can be formed from a silicone compound (Paragraph 67). A compound of Formula 3 with m=10, n=10 and R being a meth(acryloyl) group is a silicone resin with a silicon content of about 28 wt% silicon. A compound of Formula 3 with m=10, n=10 and R being a meth(acryloyl) group, meets the limitations of the instant claim with Y being a methoxy group, p=20 and 25% of the methyl groups substituted with meth(acrylate) groups. The surface portion of the composite layer (Paragraph 76) can be from 1 to 100 nm thick and the thickness is determined by being thick enough to have anti-staining and lubricity properties, while being thin enough to benefit from the hardness of the lower portion of the composite layer.

Hayashida '404 does not explicitly state the coating density of the silicon resin.

It would be obvious to one of ordinary skill in the art to vary the thickness (which would determine the coating amount of the silicone resin in the composite layer) in order to balance the properties of anti-staining and lubricity against coating hardness.

The actinic energy-ray curing hard coat agent (Paragraph 59) can be a compound having (meth)acryloyl groups (ethylenically unsaturated groups). Several of the listed compounds have three or more ethylenically unsaturated groups. The hard

coat portion of the composite layer is 1 to 10 microns thick (Paragraph 75). Thus, the thickness of the composite layer meets the limitations of the instant claims.

Regarding claim 7, Hayashida '404 (Paragraph 65) teaches that the hard coat agent portion of the composite layer can comprise 5 to 80 wt.% of an inorganic filler by weight of the hard coat agent. Since the hard coat portion of the composite layer is 1 to 10 microns thick (Paragraph 75), as opposed to the 1 to 100 nm thick silicone portion, the bulk of the coating composition weight is in the hard coat agent and thus, the limitation of the instant claim would be met.

Regarding claims 12 and 15, Hayashida '404 (Paragraph 113) teaches an optical disk with the following layers in this order: a substrate layer (12), a phase-change recording material layer (15), and a light transmitting layer (18) which can be considered as the base material for the composite hard coat layer.

Regarding claim 14, Hayashida '404 (Paragraph 117) teaches that the light transmitting layer can be 98 microns thick.

Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashida et al. (WO/2003/055679, US 2005/0106404 as equivalent), in view of Chen et al. (US 6,551,710).

Regarding claim 3, as stated above Hayashida '404 teaches an article that meets or can be obviously modified to meet the limitations of claim 1 and has a first curing resin having three or more ethylenically unsaturated groups. Hayashida '404

(Paragraph 62) further teaches that the energy-ray curing hard coat agent can be two different compounds. Other compounds can include epoxy acrylate (Paragraph 59).

Hayashida '404 does not specify the epoxy acrylate to be used.

Chen (Pages 12-15) teaches polymerizable comonomers which can be added to a coating composition for an optical article such as a video disc (Column 1, lines 3-5). Chen (Column 12, lines 3-11) further teaches that when an epoxidized monomer or oligomer is included in the coating composition it improves curing characteristics and adhesion and that the oligomer can be trifunctional. This list of epoxidized monomers or oligomers includes glycidyl methacrylate (Compound 29, Column 16), which is an epoxy acrylate. A trimer of glycidyl methacrylate would have three ring-opening polymerizable groups. As a polymerized group, glycidyl methacrylate would have more than three ring-opening polymerizable groups. The epoxidized component can be present in an amount from approximately 0.001 to 20 wt.% of the entire coating composition.

It would be obvious to one of ordinary skill in the art to use the epoxidized oligomer of Chen, as the epoxy acrylate of Hayashida '404, in order to improve curing characteristics and adhesion of the coating compound.

Regarding claim 4, Compound 29 of Chen (Column 16) meets the limitations of the instant claim, since it is the same as compound (E-1) of the instant application.

Regarding claim 5, epoxy groups are cationically polymerizable groups.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashida et al. (WO/2003/055679, US 2005/0106404 as equivalent), in view of

Iwasaki et al. (US 6,329,035). As stated above, Hayashida '404 teaches an optical recording media that meets or can be obviously modified to meet the limitations of claim 12. In Example 4 (Paragraphs 112-124), Hayashida teaches the structure of an optical disk. The light transmitting layer can be 98 microns thick (Paragraph 117). The material of the substrate is polycarbonate (Paragraph 115).

The example thickness (Paragraph 115) is thicker than the range of the instant claim. However, Hayashida does not preclude other thicknesses for this layer (Paragraph 56).

Iwasaki (Column 5, lines 31-47) teaches the structure of an optical disc. Iwasaki (Column 5, line 54 through Column 6, line 6) further teaches that the substrate of the optical disc is preferably polycarbonate of 1.2 mm (1200 microns), 0.6 mm (600 microns) or 0.3 mm (300 microns) thickness. The thin substrate is preferred from a viewpoint of substrate tilt dependency of the cross talk (Column 6, lines 2-6).

It would be obvious to one of ordinary skill in the art to use a 0.3 mm (300 micron) polycarbonate substrate, as the substrate of Hayashida, in order to minimize cross talk due to substrate tilt.

Response to Arguments

Applicant's arguments filed September 29, 2008 have been fully considered but they are not persuasive.

Applicant argues that claim 1 is not indefinite and that the silicone resin, referred to in the phrase, "a coating amount of the silicone resin is from 0.4 to 45 mg/m^2", is the

silicone resin of formula (a). However, since both this resin and the actinic energy-curing resin comprising this resin are both silicon resins, the Examiner maintains that the claim is indefinite, since the coating amount could refer to either resin.

Applicant argues that the layer of the coating of Hayashida et al. (WO/2003/055679, US 2005/0106404 as equivalent) will not intermix. Applicant points to an embodiment (second aspect) that is different than the embodiment used in the rejection (third aspect). In the third aspect, there is no half-cured process step for the hard coat layer. Further, in Paragraph 51, Hayashida teaches that this layer can be either a layer which has not been cured or has been half-cured. The Examiner maintains that there will be some intermixing of the layers in the coating of the third aspect embodiment.

Applicant argues that there is no motivation to choose the values for m and n given in the rejection of claim 1. These values were provided to show an example of how Formula 3 meets the limitations of the instant claims. There are numerous values of m and n that provide a silicon resin that meets the limitation of claim 1.

Applicant alleges unexpected results for the silicon content of 23 to 32 weight percent and provides Table 4 of the instant application as evidence. Applicant states that comparative examples h-13 and h-14 show inferior properties.

TABLE 4

Hard Coat Soln.	Remarks	Acrylic Monomer	Epoxy Monomer		Fine Particle Filler		Antifouling Agent (dimethylsiloxane derivative)							Layer Thickness (μm)
			Structure	Amount Used (%)	Kind	Amount Used (%)	Structure	Si Content (%)	Acrylic Substitution Rate (%)	Mol. Weight	Add. Amt. (%)	Si Cpd. Coating Amount (mg/m²)	Si Atom Coating Amount (mg/m²)	
h-1	Comparison	TMPTA	Compound E-1	25	-	-	-	-	-	-	-	0.0	0.0	35
h-2	Invention	TMPTA	Compound E-1	25	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35
h-3	Invention	TMPTA	Compound E-1	32	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35
h-4	Invention	TMPTA	Compound E-1	45	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35
h-5	Invention	TMPTA	Compound E-1	18	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35
h-6	Invention	TMPTA	Compound E-1	8	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35
h-7	Invention	TMPTA	Compound E-1	0	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35
h-8	Invention	TMPTA	Compound E-1	8	-	-	A	30.5	18	3,500	0.0200	3.4	1.0	17
h-9	Invention	TMPTA	Compound E-1	8	-	-	A	30.5	18	3,500	0.0200	1.6	0.5	8
h-10	Invention	TMPTA	Compound E-1	8	SiO_2	15	A	30.5	18	3,500	0.0200	1.6	0.5	8
h-11	Invention	TMPTA	Compound E-1	8	SiO_2	30	A	30.5	18	3,500	0.0200	1.6	0.5	8
h-12	Invention	BDDA	Compound E-1	25	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35
h-13	Comparison	TMPTA	Compound E-1	25	-	-	B	37.2	2	10,000	0.0200	7.0	2.6	35
h-14	Comparison	TMPTA	Compound E-1	25	-	-	A	17.1	1	3,500	0.0200	7.0	1.2	35
h-15	Invention	TMPTA	Compound E-7	25	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35
h-16	Invention	TMPTA	Compound E-21	25	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35
h-17	Invention	TMPTA	Comparative Compound E	25	-	-	A	30.5	18	3,500	0.0200	7.0	2.1	35

However, as shown in Table 4 above, these example compositions also have far lower acrylic substitution rates. This would result in much less crosslinking of the resin. It would not be surprising to one of skill in the art that a resin with lower crosslinking would be weaker.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Robinson whose telephone number is (571)272-7129. The examiner can normally be reached on Monday- Friday 8 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. R./
Elizabeth Robinson
Examiner, Art Unit 1794

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794

December 12, 2008